EFFECTS OF ROLLER-GINNING CONDITIONS ON THE SPINNING QUALITY OF ACALA AND PIMA COTTONS

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EFFECTS OF ROLLER-GINNING CONDITIONS ON THE SPINNING QUALITY OF ACALA AND PIMA COTTONS

By Henry H. Perkins, Jr.[1]

ABSTRACT

Pima and Acala cottons of varying qualities were subjected to various configurations of roller ginning related to roller-covering materials and to stationary knife-to-gin roller pressures and temperatures, to assess the effects of ginning conditions on lint quality. Certain conditions of ginning in combination with certain cotton properties caused the spinning quality of both cottons to be lowered, particularly in relation to the increased propensity of the cottons to lap up in spinning. The most serious quality deficiencies occurred when ginning cottons of low maturity and high non-cellulose content at high knife-to-gin roller pressures and temperatures.
KEYWORDS: Acala cotton, cotton, cotton ginning, cotton quality, cotton spinning, Pima.

INTRODUCTION

In the United States, Pima cottons are nearly always roller-ginned, and Acala cottons are sometimes roller-ginned. A shortcoming of roller ginning, as compared with saw ginning, is low production rate.[2] Research is being conducted in machine design and methodology to increase production rate in order to make roller ginning more practical, particularly for 'Acala 1517'.

In a 1962–63 USDA study, one objective was to compare the effects on 'Pima S–2' and 'Acala 1517' of roller ginning with a conventional system and roller ginning with a new flight-bar system (see footnote 2). Increases in end breaks in spinning occurred with the flight-bar system that were attributed to increased pressure and temperature at the point of ginning. A more serious aspect of the spinning performance was the fact that cottons from the flight-bar system had many more lapped ends (lap ups) than did cottons from the conventional roller-ginning system. (A lapped end, or lap up, is defined as an end break in spinning in which the roving wraps around a spinning roll instead of being picked up by the vacuum waste collector.) A lap up, as far as labor is concerned, is equal to three or four normal end breaks. The textile industry considers the lapping of broken ends in spinning a devastating problem.

The following year, a study (unpublished data) was conducted with a commercial gin, and one objective was to determine the effects of knife-to-gin roller pressures and temperatures on the lint quality of 'Acala 1517'. Two ginning treatments, high knife-to-gin roller pressure and low knife-to-gin roller pressure, were employed. No significant differences occurred in end breaks in spinning, but the percentage of ends lapped in spinning was much higher for the high temperature-pressure treatment than for the low temperature-pressure

[1]Research chemist, Cotton Quality Research Station, Science and Education Administration, U.S. Department of Agriculture, Clemson, S.C. 29631.

[2] Chapman, W. E., Jr., and Stedronsky, V. L. 1965. Comparative performance of saw and roller gins on Acala and Pima cottons. U.S. Dep. Agric. Mark. Res. Rep. No. 695, 14 pp.

treatment (91 versus 42 percent). The results of this study supported the findings from the previous study in relation to lap ups in spinning. In each of these studies, the differences in spinning performance could not be explained from changes in physical fiber properties, since the ginning treatments did not significantly affect the commonly measured physical properties of the cottons.

The two studies mentioned above, in which increased lap ups in spinning were observed for certain configurations of roller ginning, were not specifically designed to study this particular property. The results are cited simply to point out the original observation of a potential problem in spinning certain roller-ginned cottons. A series of six studies was conducted to determine the effects of various combinations of roller-ginning conditions on the spinning quality of 'Acala 1517', 'Stroman Acala', 'Pima S–2', and 'Pima S–4' and the factors that cause the differences in processing behavior of the cottons, particularly as concerns the tendency of these cottons to lap up during the spinning process. This report summarizes the results of these studies.

PROCEDURES AND RESULTS

All cottons in these studies were subjected to standard tests for length and fineness. Chemical tests were performed to determine sugar content, wax content, alcohol extractables, and, in some cases, oil contamination. Lapping potential in spinning was measured with two tests. The first test was a spinning test and consisted of a normal spinning run. The spinning frame was inspected every 15 minutes, and the number of ends down and lap ups was recorded. At the time of recording, the lap ups were removed, and the ends were pieced up. Lap ups were calculated as a percentage of the total ends down. The second test was strictly a lap-up test. In this test all ends were intentionally broken down, and the frame was run as usual, with each roving end coming through its respective spinning roll. The roving was then fed into the vacuum waste collector rather than to the spinning bobbins. The frame was inspected every 15 minutes, and each roving end that had lapped around the front roll was recorded as a lap up. After recording, the lap was removed, and the roving was refed into the vacuum waste collector for the next 15-minute run. The lap ups were calculated as a percentage of the total number of lap ups possible. In some of the studies, both lap-up tests were conducted, whereas in other studies only one or the other of the tests was conducted.

All yarn-manufacturing specifications and conditions used in the six studies were selections based on fiber properties of the cottons and were considered normal for the types of cottons processed. For the studies in which statistical analysis was appropriate, Duncan's multiple-range test was used to determine differences in lap ups and fiber length.

Study No. 1

Small lots of 'Acala 1517' were ginned on an 8-inch laboratory gin. Walrus leather and rubber-fabric laminate were evaluated as roller coverings over a range of knife-to-roller tem-

TABLE 1.—*Ginning conditions, chemical test results, and spinning lap ups, study No. 1*

Lot No.	Roller covering	Knife-to-gin roller conditions		Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Spinning lap ups[1] (pct)
		Pressure (lb/inch²)	Temperature (°F)				
1	Walrus leather	65	95	0.44	0.79	2.84	23b
2	..... do	129	160	.43	.79	2.77	5c
3	Rubber-fabric	65	105	.42	.81	2.79	26b
4	..... do	129	180	.42	.83	2.80	100a
5	..... do	129	115	.43	.79	2.77	18b
6	..... do	65	205	.42	.81	2.86	100a
7	Walrus leather	129	108	.42	.78	2.83	3c
8	..... do	65	190	.42	.81	2.81	2c

[1] Means not having a letter in common are significantly different at the 95-percent level. Lap ups determined by the lap-up test.

peratures and pressures. Ginning treatments were not replicated. Each treatment lot was processed individually and tested for lapping potential (2 replications) on an 84-spindle spinning frame.

The physical properties of the lots were typical for 'Acala 1517' and did not differ among treatment conditions. The levels of sugar, wax, and alcohol-extractable content, determined on drawing sliver, were high. Ginning conditions, results of chemical tests, and spinning lap ups are shown in table 1. The clear implication from these results is that the combination of rubber-fabric roller covering and high temperature caused these cottons to lap up severely in spinning.

Study No. 2

A full-scale study using bale lots of 'Acala 1517' ginned on a full-size gin was conducted. Walrus leather and rubber-fabric laminate were used as gin-roller coverings over a range of knife-to-gin roller temperatures and pressures. Treatments were replicated three times.

The physical properties of the lots were typical for 'Acala 1517'. The levels of sugar, wax, and alcohol-extractable content, determined on raw stock, were typical for 'Acala 1517' and were much lower than for the cottons in study No. 1. Ginning conditions and results of chemical tests are shown in table 2. Several of these bales were accidentally preblended before processing, resulting in mixed treatments. Therefore, no statistical interpretation of results was possible. However, lap ups in spinning were below 5 percent for all lots, indicating that these cottons, regardless of ginning treatment, did not have a strong tendency to lap up. This result has since been at least partially explained by research which revealed that cottons having low levels of noncellulosics, as compared with cottons having high levels of noncellulosics, are less prone to develop spinning deficiencies when subjected to extreme ginning treatments.

Study No. 3

Small lots of both 'Acala 1517' and 'Pima S–2' were ginned on a 15-inch laboratory gin, with roller-covering materials and knife-to-gin roller temperatures and pressures as variables. Treatment lots were processed individually, and lapping potential was evaluated by testing on an 84-spindle spinning frame. Treatments were not replicated.

The physical properties of both 'Pima S–2' and 'Acala 1517' were typical and did not differ among treatment conditions. For the 'Pima S–2', the levels of sugar, wax, and alcohol-extractable content were typical for good-quality cotton. For the 'Acala 1517', the levels of sugar and alcohol-extractable content were on the high side of the normal range, and the level of wax content was about average. Ginning conditions, cotton varieties, results of chemical tests (determined on raw stock), and spinning lap ups are shown in table 3. Spinning lap ups were relatively low, and no differences in lap ups occurred that could be attributed to ginning treatments.

TABLE 2.—*Ginning conditions and chemical test results, study No. 2*

Bale lot No.	Replication number	Roller covering	Knife-to-gin roller conditions		Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)
			Pressure (lb/inch)	Temperature (°F)			
1	1	Rubber-fabric	38	110	0.23	0.61	2.17
2	1	do	85	200	.23	.56	2.17
3	1	Walrus leather	80	110	.22	.50	2.12
4	1	do	124	200	.23	.55	2.19
5	2	Rubber-fabric	85	200	.20	.51	2.18
6	2	do	38	110	.23	.57	2.10
7	2	Walrus leather	80	110	.18	.50	2.00
8	2	do	124	200	.23	.55	1.94
9	3	do	80	110	.25	.50	2.19
10	3	do	124	200	.19	.53	2.01
11	3	Rubber-fabric	85	200	.23	.51	2.17
12	3	do	38	110	.23	.51	2.19

TABLE 3.—*Ginning conditions, chemical test results, and spinning lap ups, study No. 3*

Lot No.	Variety	Roller covering	Knife-to-gin roller conditions		Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Spinning lap ups[1] (pct)
			Pressure (lb/inch)	Temperature (°F)				
1	'Pima S-2'	Rubber-fabric	38	110	0.18	0.50	1.88	5.5
2	.... do	do	85	220	.17	.50	1.83	3.3
3	.... do	Walrus leather	80	90	.18	.52	1.89	7.9
4	.... do	do	120	200	.19	.52	1.93	6.0
5	'Acala 1517'	do	128	205	.38	.58	2.66	4.2
6	.... do	Rubber-fabric	80	200	.39	.61	2.76	1.3
7	.... do	do	38	90	.43	.60	2.77	16.6

[1] Lap ups determined by the spinning test.

TABLE 4.—*Ginning conditions, micronaire values, chemical test results, and spinning lap ups, study No. 4*

Test cotton and lot No.[1]	Roller covering	Knife-to-gin roller conditions		Micronaire reading	Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Spinning lap ups[2] (pct)
		Pressure (lb/inch²)	Temperature (°F)					
Cotton A:								
1A	Walrus leather	63	105	3.8	0.46	0.59	2.79	20.6b
2A	..... do	63	204	3.9	.45	.61	2.68	20.6b
3A	..... do	127	116	3.8	.45	.60	2.72	15.6b
4A	..... do	127	216	4.0	.44	.58	2.66	12.1b
5A	Rubber-fabric	62	104	3.9	.41	.58	2.64	13.7b
6A	..... do	62	209	4.0	.43	.58	2.64	17.2b
7A	..... do	125	113	3.8	.44	.55	2.74	17.7b
8A	..... do	125	217	4.0	.43	.58	2.70	38.7a
Cotton B:								
1B	Walrus leather	63	91	4.1	.26	.53	2.13	2.4b
2B	..... do	63	195	4.2	.24	.55	2.07	.0b
3B	..... do	127	99	4.1	.25	.50	1.99	.0b
4B	..... do	127	197	4.2	.23	.49	2.03	2.4b
5B	Rubber-fabric	62	99	4.2	.24	.52	2.06	1.2b
6B	..... do	62	192	4.3	.23	.52	2.07	1.7b
7B	..... do	125	100	4.2	.24	.53	2.06	2.9b
8B	..... do	125	200	4.3	.24	.55	2.07	43.0a
Cotton C:								
1C	..... do	62	98	3.6	.70	.74	2.99	6.2c
2C	..... do	62	199	3.6	.70	.77	2.93	52.4b
3C	..... do	125	98	3.6	.70	.68	2.86	14.8c
4C	..... do	125	198	3.6	.70	.71	2.92	79.3a
5C	Walrus leather	63	97	3.3	.76	.74	2.99	3.9c
6C	..... do	63	197	3.5	.74	.72	2.89	4.6c
7C	..... do	127	98	3.4	.72	.68	2.94	3.9c
8C	..... do	127	197	3.6	.76	.72	2.94	3.9c

[1] Cotton A, 'Stroman Acala'. Cotton B, first-picked 'Acala 1517'. Cotton C, second-picked 'Acala 1517'.

[2] Average of tests with and without crush rolls for carding. Within a cotton type, means not having a letter in common are significantly different at the 95-percent level. Lap ups determined by the spinning test.

Study No. 4

Data from previous tests have indicated that some interaction of ginning treatment with fiber properties is involved, i.e., some cottons are more susceptible to extreme ginning treatments than others. Small lots of 'Acala 1517', varying in maturity, were selected to span a range of noncellulose-content levels to test the hypothesis that high-noncellulose cottons are more prone to develop spinning deficiencies than low-noncellulose cottons when subjected to extreme ginning treatments.[3] Cotton A, 'Stroman Acala', harvested during the previous season and stored 1 year, was intermediate in noncellulosics. Cotton B, first-picked 'Acala 1517', before frost, was low in noncellulosics and typical of good-quality cotton. Cotton C, second-picked 'Acala 1517', after frost, from the same field as cotton B, was high in noncellulosics.

The cottons were ginned on an 8-inch laboratory gin with the same roller-covering materials and over a range of knife-to-gin roller temperatures and pressures as in the previous studies. Ginning treatments were not replicated. In mill processing, one-half of each treatment lot was carded with card crush rolls, and the other half was carded without crush rolls. Lapping potential was evaluated by testing on an 84-spindle spinning frame.

Ginning conditions, results of chemical tests (determined on raw stock), micronaire readings, and spinning lap ups are shown in table 4. Spinning lap ups were not related to the crush-roll carding (with or without) conditions (table 5). More lap ups in spinning occurred with cottons ginned with rubber-fabric roller covering than with cottons ginned with walrus-leather roller covering. The effect was more pronounced with the more severe ginning conditions. In every case, the high-pressure, high-temperature treatment with rubber-fabric covering had a higher level of lap ups than did any other treatment. With cotton C, the low-pressure, high-temperature treatment with rubber-fabric covering also had a high level of lap ups. This indicates that, in conjunction with the rubber-fabric roller covering, the high-temperature condition might have been more highly related to lapping than was the high-pressure condition. The effect of the ginning treatments on spinning lap ups for cottons ginned with rubber-fabric roller covering is shown in table 6.

The tendency of a cotton to lap up in spinning is affected by the relationship of the nature of the cotton to the ginning treatment. Cotton C, a low-micronaire, high-noncellulose cotton, was more susceptible to extreme ginning treatments than were the other cottons. In addition to the poor spinning performance, cotton C from the high-temperature, high-pressure treatment with rubber-fabric roller covering performed poorly in roving because of a buildup of lint residues on the top front rolls, which caused lap ups. No other cotton or ginning treatment caused a roving problem.

TABLE 5.—*Effects of roller coverings and card crush rolls on spinning lap ups, study No. 4*

Test cotton[1]	Roller covering	Lap ups (pct)[2]	
		With crush rolls	Without crush rolls
A	Rubber-fabric	28	31
A	Walrus leather	22	28
B	Rubber-fabric	17	24
B	Walrus leather	3	4
C	Rubber-fabric	48	45
C	Walrus leather	9	8
Average		21	23

[1] Cotton A, 'Stroman Acala'. Cotton B, first-picked 'Acala 1517'. Cotton C, second-picked 'Acala 1517'.

[2] Average of spinning test and lap-up test obtained by averaging across knife-to-gin roller conditions.

TABLE 6.—*Effects of ginning treatments on spinning lap ups for cottons ginned with rubber-fabric covering, study No. 4*

Knife-to-gin roller conditions	Lap ups[1] (pct)
Low pressure, low temperature	11
Low pressure, high temperature	34
High pressure, low temperature	16
High pressure, high temperature	68

[1] Average of spinning test and lap-up test obtained by averaging across cottons.

[3] Perkins, Henry H., Jr. 1971. Some observations on sticky cottons. Text. Ind. (Atlanta) 135(3): 49–64.

Study No. 5

Small lots of 'Acala 1517' of varying maturity were ginned on 8-inch or 15-inch gins to determine the possible effects of roller size on spinning lap ups. Cotton D, first-picked 'Acala 1517', before frost, was mature and low in noncellulosics, and cotton E, second-picked 'Acala 1517', after frost, was immature and high in noncellulosics. The 8-inch gin was the same one used in the previous studies, and the 15-inch gin was a commercial, reduced-width, rotary-knife gin. Each gin roller was covered with standard rubber-fabric roller-covering material. The walrus-leather roller covering became impractical to use and thus was eliminated because of its lack of availability and poor ginning efficiency. Knife-to-gin roller temperatures and pressures were varied as in the other studies. Two replications of the ginning treatments were conducted. Lapping potential was evaluated by processing on an 84-spindle spinning frame.

Ginning conditions, micronaire readings, fiber-test results (determined on raw stock), and spinning lap ups are shown in table 7. The 2.5-percent span lengths of cottons ginned on the 8-inch gin were shorter than those of cottons ginned on the 15-inch gin. The level of lap ups for cottons ginned on the 15-inch gin was low, and differences between cottons and between treatments were not significant. Lap ups were much higher for the cottons ginned with the 8-inch gin than they were for those ginned with the 15-inch gin. Evidently, there was some real difference in ginning action between the two gins. The results obtained with the 8-inch gin, in which the high-pressure, high-temperature treatments caused spinning lap ups, were similar to those obtained with the 8-inch gin in studies No. 1 and No. 4.

Study No. 6

A study using bale-size lots of 'Acala 1517' and 'Pima S–4', ginned on a full-size rotary-knife gin with a 15-inch-diameter roller, was conducted. Both of the cottons were low-micronaire, high-noncellulose cottons. Knife-to-gin roller temperatures and pressures were varied as in the previous studies. Treatments were replicated 3 times, and spinning was on 1,000 spindles.

Ginning conditions, micronaire readings, results of chemical tests (determined on drawing sliver), and spinning lap ups are shown in table 8 for 'Acala 1517' and in table 9 for 'Pima S–4'. Some of these cottons contained hydrocarbon oil contamination, probably from harvesting, which prevented a full interpretation of results. Physical properties of the cottons did not vary in relation to ginning treatment.

There were differences in cottons between replications. For example, several of the 'Pima S–4' bales had different sugar-content levels (lots 13, 14, and 15). However, the most significant differences, as far as the effect on processing quality is concerned, were the differences

TABLE 7.—*Ginning conditions, micronaire values, chemical test results, and spinning lap ups, study No. 5*

Gin-roller size and rep. No.[1]	Knife-to-gin roller conditions		Micronaire reading	Fibrograph 2.5-pct span length (inches)	Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Spinning lap ups[2]	
	Pressure (lb/inch)	Temperature (°F)						Spinning-test method (pct)	Lap-up test method (pct)
8-Inch:									
1D	34	98	4.5	1.18	0.30	0.52	2.14	2.2c	3.4c
2D	68	202	4.4	1.18	.33	.54	2.16	38.5b	79.2b
3E	34	100	2.7	1.18	1.04	1.02	4.03	3.7c	12.3c
4E	68	201	2.8	1.18	1.04	1.10	4.06	90.5a	97.5a
15-Inch:									
5D	34	103	4.5	1.21	.34	.57	2.27	10.0a	7.1a
6D	68	203	4.4	1.21	.37	.58	2.26	9.3a	4.8a
7E	34	103	2.7	1.21	1.05	1.05	4.01	8.1a	11.3a
8E	68	207	2.8	1.21	.91	.98	3.56	2.7a	14.6a

[1] Cotton D—'Acala 1517', first-picked. Cotton E—'Acala 1517', second-picked.

[2] Within a gin-roller size, means not having a letter in common are significantly different at the 95-percent level.

in hexane extractables. Hexane-extractable levels greater than 0.25 percent for 'Acala 1517' and greater than 0.15 percent for 'Pima S–4' indicate hydrocarbon oil contamination, which was apparently the most significant factor affecting spinning lap ups in this study. Coefficients of simple correlation (r) for spinning lap ups versus hexane extractables for 'Acala 1517' and 'Pima S–4' are 0.90 and 0.89, respectively (figs. 1 and 2). The effects of oil contamination on cotton quality have been established in other studies in our laboratory.[4] Oil contamination was verified by observing blue-white fluorescence of raw stock and hexane

[4] Perkins, Henry H., Jr. Oil contamination of cotton in harvesting. The Cotton Gin and Oil Mill Press, Sept. 27, 1975, pp. 8–9. Perkins, Henry H., Jr., and Charles K. Bragg. 1977. Effects of oil contamination on cotton quality: Methods of analysis and characterization of contaminants, Text. Res. J., 47 (4): 271–277.

TABLE 8.—*Ginning conditions, micronaire values, chemical test results, and spinning lap ups for 'Acala 1517' cotton, study No. 6*

Bale lot No.	Rep. No.	Knife-to-gin roller conditions		Micronaire reading	Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Hexane extractables (pct)	Spinning lap ups[1] (pct)
		Pressure (lb/inch²)	Temperature (°F)						
3	1	70	135	2.7	1.46	1.12	4.11	0.22	15.4
6	2	70	135	2.7	1.58	1.18	4.20	.29	27.2
12	3	70	135	2.6	1.51	1.29	4.34	.44	52.5
1	1	70	200	2.8	1.36	1.20	4.17	.29	38.1
5	2	70	200	2.7	1.45	1.25	4.34	.41	51.4
10	3	70	200	2.5	1.37	1.30	4.30	.35	55.7
2	1	140	135	2.7	1.62	1.16	4.21	.26	37.8
8	2	140	135	2.6	1.47	1.25	4.29	.35	38.6
11	3	140	135	2.6	1.50	1.36	4.47	.53	72.5
4	1	140	200	2.8	1.47	1.29	4.20	.37	54.2
7	2	140	200	2.5	1.51	1.26	4.37	.36	51.0
9	3	140	200	2.5	1.51	1.35	4.40	.42	56.4

[1] Lap ups determined by the spinning test.

TABLE 9.—*Ginning conditions, micronaire values, chemical test results, and spinning lap ups for 'Pima S–4' cotton, study No. 6*

Bale lot No.	Rep. No.	Knife-to-gin roller conditions		Micronaire reading	Sugar content (pct)	Wax content (pct)	Alcohol extractables (pct)	Hexane extractables (pct)	Spinning lap ups[1] (pct)
		Pressure (lb/inch²)	Temperature (°F)						
14	1	70	115	3.2	0.46	0.79	2.48	0.18	15.7
19	2	70	115	3.4	.34	.75	2.25	.13	9.1
22	3	70	115	3.6	.32	.73	2.12	.12	8.8
16	1	70	210	3.5	.42	.72	2.33	.13	8.6
17	2	70	210	3.4	.42	.85	2.41	.33	29.6
23	3	70	210	3.3	.33	.79	2.39	.14	15.3
13	1	140	115	3.4	.51	.73	2.43	.17	15.8
18	2	140	115	3.5	.40	.81	2.36	.25	26.1
21	3	140	115	3.6	.32	.76	2.20	.21	15.5
15	1	140	210	3.2	.62	.83	2.80	.16	20.9
20	2	140	210	3.5	.35	.79	2.29	.19	16.2
24	3	140	210	3.3	.43	.87	2.55	.22	21.7

[1] Lap ups determined by the spinning test.

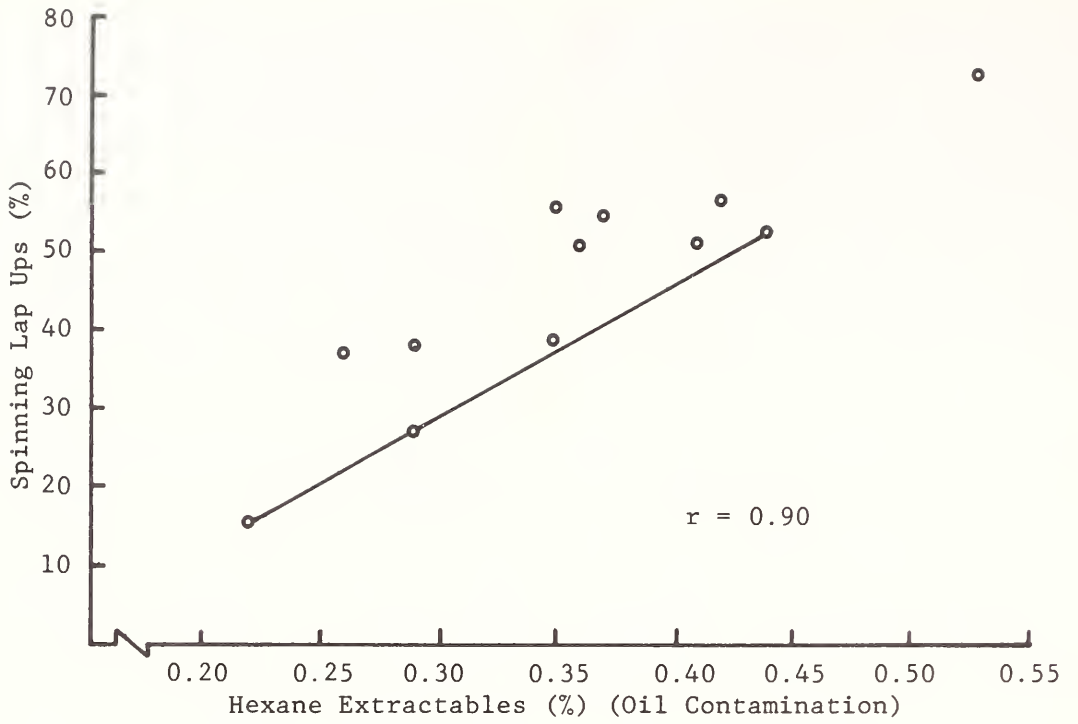

FIGURE 1.—Effect of hexane extractables on spinning lap ups in 'Acala 1517' cotton, study No. 6.

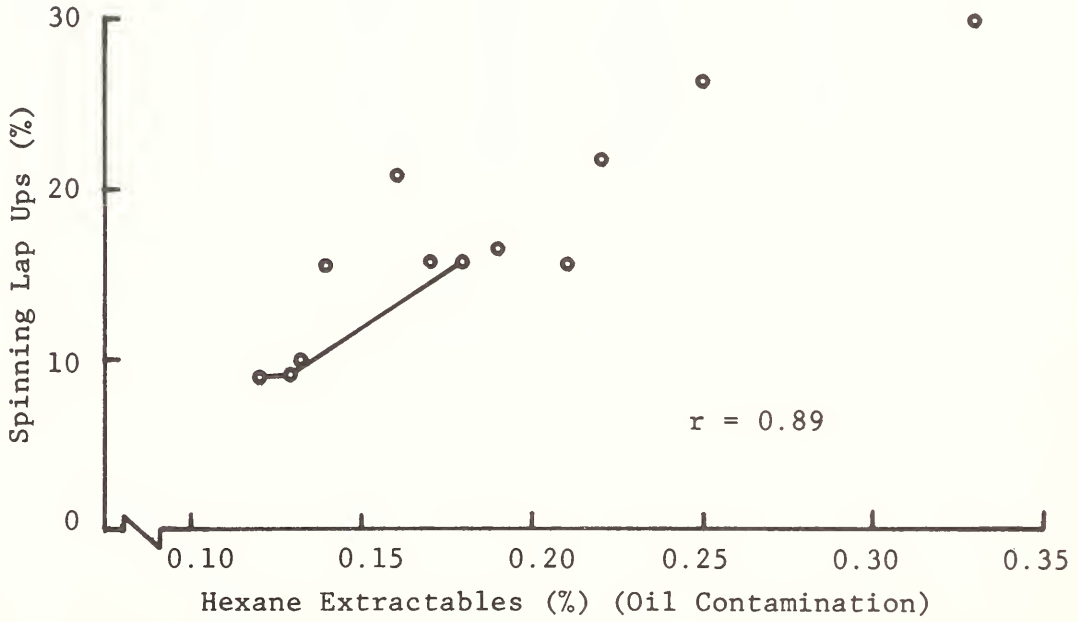

FIGURE 2.—Effect of hexane extractables on spinning lap ups in 'Pima S-4' cotton, study No. 6.

extracts under ultraviolet light. Even though oil contamination was apparently the overriding factor causing spinning lap ups, the normal ginning treatments seem to have been affected to a lesser extent than the more severe treatments. Figures 1 and 2 show that for any level of contamination, the level of lap ups was lowest for the normal ginning treatment. The points connected by solid lines represent the normal ginning conditions. The inference is that lap ups were related to ginning condition as well as to oil contamination.

CONCLUSIONS

Certain configurations of roller ginning in combination with certain fiber-property configurations caused the spinning quality of both Acala and Pima cottons to be lowered, particularly as concerns the increased propensity of the cottons to lap up in spinning. This tendency of the cottons to lap up was related to high knife-to-gin roller temperatures and pressures with rubber-fabric roller covering when ginning low-maturity, high-noncellulose cottons. This effect was particularly pronounced with the 8-inch gin roller. Since several of these studies were small scale and some difficulties were encountered, conclusions should probably be limited to this single general conclusion. However, from a summary standpoint, there is little doubt that under certain conditions of ginning with certain cottons, problems can occur. Those involved in roller-ginning research should be acutely aware of the potential problem.

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